

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

PUBLICATION NUMBER : 56019030  
PUBLICATION DATE : 23-02-81

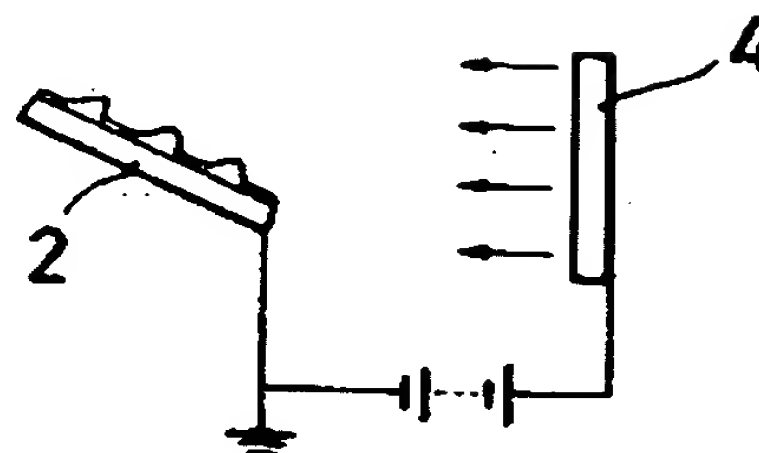
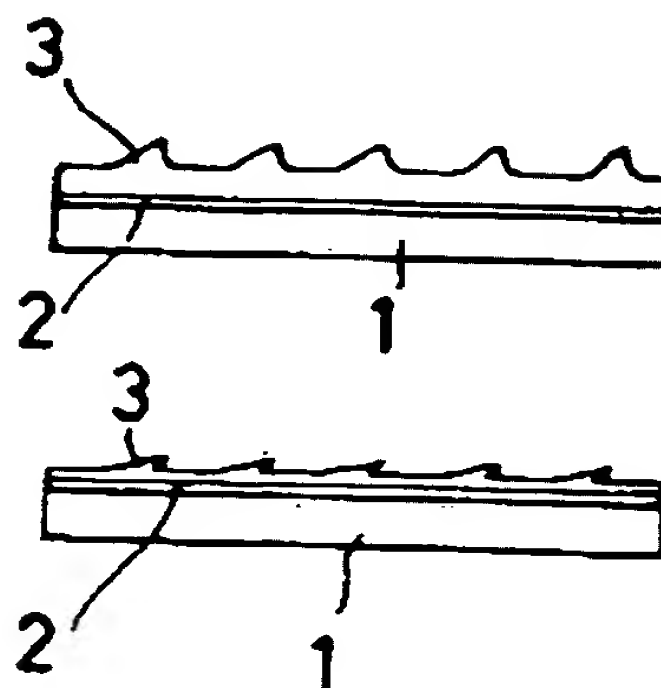
APPLICATION DATE : 25-07-79  
APPLICATION NUMBER : 54095195

APPLICANT : SHARP CORP;

INVENTOR : TODA KIYOSHI;

INT.CL. : G02F 1/133 G09F 9/00

TITLE : PRODUCTION OF LIQUID CRYSTAL  
DISPLAY ELEMENT



ABSTRACT : PURPOSE: To produce a liquid crystal display element of good display grade by sputtering ion beams to the orientation film formed on an electrode surface by a diagonal vapor deposition method thereby decreasing the angle of orientation of said orientation film.

CONSTITUTION: Material of  $\text{SiO}$  or  $\text{MgF}_2$  is diagonally evaporated to a substrate 1 provided with an electrode 2, at about  $10^{-5}$  Torr degree of vacuum and about  $85\sim 89^\circ$  incident angle to the substrate, whereby an orientation film 3 is formed (the orientation film of superior degree of orientation order S is obtained at about  $20\sim 30^\circ$  orientation angle  $\theta$ ). Next, this is supported with inclination to an ion beam source 4 and is subjected to ion beam etching under conditions of about  $10^{-3}\sim 10^{-5}$  Torr vacuum degree and about  $60\sim 90^\circ$  incident angle to the substrate, so that the orientation angle  $\theta$  is made about  $\leq 3^\circ$ . The electrode plate having the orientation film formed in the above-mentioned manner (small in orientation angle and superior in the degree of order) is particularly suited for liquid crystal display elements of high duty.

COPYRIGHT: (C)1981,JPO&Japio